

STATE OF VERMONT  
PUBLIC SERVICE BOARD

Docket No. 5270-HDWK-1

Investigation into Least-Cost )  
Investments, Energy Efficiency, )  
Conservation and Management of )  
Demand for Energy In Re: Hardwick )  
Electric Department's Integrated )  
Resource Plan )

Order Entered: 12/2/94

PRESENT: Kari T. Dolan, Hearing Officer

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I. INTRODUCTION

A. Summary

This Proposal For Decision recommends that the Public Service Board ("Board") approve the integrated resource plan ("IRP") of the Town of Hardwick Electric Department ("Hardwick" or "HED"), subject to certain conditions specified herein. Hardwick is the third member of the Vermont Public Power Supply Authority ("VPPSA") to have its IRP considered for approval by the Board.<sup>1</sup>

The Department of Public Service ("DPS" or the "Department") states that it cannot recommend the approval of Hardwick's IRP, and raises concerns with several aspects of the IRP. Exh. DPS-A at 39. I recommend approval of the IRP based on my review of the IRP and in consideration of the filings presented by Hardwick, VPPSA, and the DPS. While Hardwick's IRP is flawed in certain respects, I believe that, with the modifications recommended in this Proposal for Decision, it is an acceptable "first effort" by Hardwick to provide least-cost electric service to Hardwick's customers. Hardwick has already begun to implement some of the energy efficiency programs detailed in its IRP and has had some success in securing cost-effective savings. Moreover, none of the IRP's deficiencies is likely to substantively affect the supply and demand resource decisions anticipated by Hardwick in the near future. Consequently, HED will be able to address any imperfections and incorporate the modifications described in detail below when it files its next IRP in June, 1996.

Hardwick's IRP consists in part of demand-side management ("DSM") programs that, by the end of this year, will be acquiring energy efficiency resources across all customer classes. Hardwick estimates that it will save a total of 7,290 MWh through the year 1998. For the year 1998 alone, Hardwick

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1. The other VPPSA members with approved IRPs are the Village of Ludlow Electric Department ("Ludlow"), Docket No. 5270-LDLW-1, Order of 12/3/92, and the Village of Lyndonville Electric Department ("Lyndonville"), Docket No. 5270-LYND-1, Order of 11/30/93.

estimates that its energy efficiency programs will save 1,930 MWh and reduce HED's capacity needs by 440 kW. The dollar value of these savings is \$74,630 (in 1994 dollars).

In order to achieve total savings through the year 1998 and beyond, Hardwick plans to invest almost \$364,100 in nominal dollars over the five-year life of the programs. In 1994 dollars, Hardwick's investment is about \$335,200, and the programs' total societal cost (i.e., the sum of customer and utility costs, adjusted to reflect external costs) is estimated to be \$489,800. The programs' cumulative savings (in 1994 dollars) are projected at \$618,980. The net societal benefit of these programs is projected to be approximately \$129,200 with a societal benefit-to-cost ratio of 1.26.

Prior to the filing of its next IRP on June 1, 1996, I recommend that the Board direct Hardwick to complete a study of its transmission and distribution system, to improve its analytical methods for estimating future loads, to enhance its supply plan to better reflect least-cost planning principles, to file its first annual DSM program, and to file plans for monitoring and evaluating ("M&E") its current DSM programs.

B. Background

METRIX, on behalf of Hardwick, filed the first draft of its integrated resource plan on June 18, 1991, in compliance with the Board's Orders of 4/16/90 in Docket No. 5270 and 3/13/91 in Docket No. 5270 Phase V. METRIX subsequently filed a number of revisions, additions, and updates, which are contained in the filings of 7/24/91, 9/24/91, 11/7/91, 12/5/91, 1/20/92, and 5/21/92.

Hardwick terminated its contractual relationship with METRIX and joined VPPSA on October 21, 1992.

On April 30, 1993, Hardwick filed a revised IRP. VPPSA, on behalf of Hardwick, filed a revised Transmission and Distribution ("T&D") plan on June 3, 1993. On March 7, 1994, VPPSA filed revisions to the DSM component of Hardwick's IRP, and indicated that Hardwick was requesting formal Board approval of its IRP.

The Board designated Kari T. Dolan as Hearing Officer and held a prehearing conference on April 7, 1994, to set a schedule for prefiled testimony and a technical hearing.

On May 3, 1994, the Board held the technical hearing at which Hardwick, VPPSA, and the DPS presented evidence and cross-examined witnesses. Jack Young, General Manager of Hardwick, represented the Hardwick Electric Department. William B. Piper, Esq., of Primer & Piper, P.C., and David Kroop, Esq., represented VPPSA and the Department of Public Service, respectively.

On May 9, 1994, VPPSA filed information requested at the technical hearing that includes, among other items, the twenty year capability responsibility requirement that incorporates the DSM programs (exh. Hardwick CJU-5) and a summary of Hardwick farm audit measures (exh. Hardwick CJU-6).<sup>2</sup>

On May 31, 1994, the Department filed a motion to compel, without a

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2. I took official notice of exhibits CJU-5 and CJU-6, noting that they would become part of the official record at the time of their filing, at the technical hearing. Tr. 5/6/94 at 237-238. They were ultimately filed with the Board on May 9, 1994.

protective agreement, the delivery of proposals submitted by three vendors seeking to offer Hardwick services under the Small Commercial and Industrial ("C&I") energy efficiency program. VPPSA filed an opposition to the Department's motion on June 6, 1994. A hearing was held on the Department's motion to compel the next day. After giving each party an opportunity to comment on the other party's filings, I denied the Department's motion to compel. I then issued an Order on June 14, 1994, which reaffirmed my decision given orally at the June 7th hearing.

Based on the parties' testimony, exhibits and other evidence in this Docket, I hereby report the following findings and conclusions to the Board in accordance with 30 V.S.A. §8.

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## II. FINDINGS OF FACT

### A. Load Forecast

1. In 1990, Hardwick provided 33,987 MWh of electricity to its customers, serving a peak demand of 6.67 MW. In the year 2000, Hardwick projects its energy consumption to be 40,128 MWh with a peak demand of 6.79 MW. Exh. Hardwick CJU-4 at 1.1.1-1.1.3.
2. VPPSA used the five-year peak and energy forecasts that METRIX had prepared for Hardwick in 1991 and extended those forecasts linearly from 1993 to the year 2012 to cover a full twenty-year planning period. Tr. 5/3/94 at 25-26, 40; exh. Hardwick CJU-4 at 1.1.4; exh. DPS-A at 3.
3. When extrapolating the METRIX regression data to the year 2012, VPPSA did not disaggregate the energy requirements by end-use or customer class. VPPSA also grouped energy losses on the system with sales. Exh. DPS-A at 2, 6-7; exh. Hardwick CJU-4 at 1.1.3.
4. VPPSA evaluated the peak and energy forecasts that were prepared by METRIX by comparing the output from the forecasts with historical consumption (through 1992). Tr. 5/3/94 at 38-41.
5. Hardwick's peak load forecast for the year 1991, which were prepared by METRIX, is 6.08 MW, about 4.7 percent below the actual peak load (6.38 MW) for that year. For the subsequent year, the peak load forecast of 6.16 MW is

approximately 3.3 percent below Hardwick's actual peak load value of 6.37 MW. The forecasted peak for 1993 is 6.24 MW, within about two percent of the actual peak at 6.38 MW. Exh. DPS-A at 4; exh. Hardwick CJU-4 at 1.1.1, Att. 1.1.

6. Hardwick's forecasted energy requirements for the year 1991 are 33,614 MWh, almost 2.1 percent above Hardwick's actual energy requirements of 32,925 MWh. In 1992, the forecasted energy requirements of 34,338 MWh are 3.8 percent above the actual energy requirements (33,081 MWh).<sup>3</sup> Hardwick's forecasted energy requirements for 1993 are 35,062 MWh, 8.6 percent above HED's actual energy requirements for that year of 32,283 MWh. Exh. DPS-A at 4-5; exh. Hardwick CJU-4 at 1.1.1, Att. 1.1.

7. VPPSA reports that the mean percent error of the load forecast is 6.67 percent and the peak forecast's mean percent error is 4.37 percent. Tr. 5/3/94 at 26.

#### B. Supply-Side Resources

8. The supply section of Hardwick's IRP contains a supply-only Base Case plan. It does not reflect any DSM programs presented in the IRP. VPPSA did prepare a supply plan that reflects the DSM programs and submitted it to the Department during discovery on April 8, 1994, the day before the DPS's pre-filed testimony was due. The Board received the post-DSM plan, Exhibit Hardwick CJU-5, on May 9, 1994, following the technical hearing in this proceeding. Tr. 5/3/94 at 41-42; exh. Hardwick CJU-5; DPS Brief at 18.

9. VPPSA stated that complying with the Department's concerns raised in both the load forecast and supply areas would not affect any DSM allocation decisions between now and the next IRP filing. Tr. 5/3/94 at 223.

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3. The information in Hardwick's IRP appears to report the forecast data in "power" years rather than in calendar years. (NEPOOL divides the year into two, six-month power periods -- a winter power period, November through April and summer power period, May through October). In reviewing actual energy requirements data for the 1992 calendar year, METRIX's forecasted energy requirement is 3.1 percent above Hardwick's reported actual energy requirement.

10. Hardwick is committed to use least-cost planning principles in all future supply resource acquisition decisions. Tr. 5/3/94 at 240.

C. Transmission and Distribution

11. The DPS and Hardwick entered into an agreement in May, 1993 which outlines the parameters for a comprehensive, long-term study of Hardwick's T&D system. Those parameters for the study are consistent with the DPS's Twenty Year-Electric Plan, Board Orders, and statutes. Exh. Hardwick CJU-4 at 3.9.2; exh. DPS-A at 37.<sup>4</sup>

12. Hardwick does not plan to make any investments in its T&D system until the comprehensive study is complete. Tr. 5/3/94 at 100.

13. The mapping of Hardwick's distribution system was about half complete at the time of the hearing, and Hardwick anticipates completing the mapping within six weeks of the hearing. Hardwick is also committed to completing the T&D study within three months of the hearing in this docket. Tr. 5/3/94 at 97-98.

14. With the incorporation of the DPS's recommendations, Hardwick's proposed T&D study is adequate for the purposes of this IRP.<sup>5</sup> Tr. 5/3/94 at 117-118.

D. Demand-Side Resources

15. Over the five-year implementation period, Hardwick plans to invest

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4. The DPS' Twenty-Year Electric Plan is the public policy document for the State's electric power industry. The Plan contains long range goals, objectives, and recommendations for meeting Vermont's electric needs.

5. The DPS recommends that the Board should direct Hardwick: (1) to complete the optimization study expeditiously; (2) to provide the Department with an updated schedule for completing the T&D study, the budget for the study, and a copy of the contract between Hardwick and the consultant that is performing the study; and (3) to consult with the DPS before beginning the actual study in order to discuss the specifics of that study. On pages 25-25 below, I address the DPS's recommendations on this point. DPS Brief at 26.



\$335,200 on its energy efficiency programs to acquire \$618,980 in benefits for its electric system, resulting in a utility benefit cost ratio of 1.85 (NPV, 1994 dollars). Exh. Hardwick CJU-3.

16. Hardwick anticipates securing energy efficiency resources across all customer classes beginning in 1994. Hardwick expects to achieve 7,290 MWh in total energy savings from its energy efficiency programs during the programs' five-year implementation life. For the year 1998, Hardwick expects to reduce its capacity needs by 440 kW. Id.

17. From a societal perspective, Hardwick estimates that its energy efficiency programs will save \$618,980 at a cost of \$489,815, for a societal benefit cost ratio of 1.26 (NPV, 1994 dollars). Id.

18. Hardwick is implementing or is planning to implement the following DSM programs in an effort to provide comprehensive energy efficiency services to its customers:

- Electric Space Heat Fuel Switching
- Appliance Disposal
- Residential Moderate-Use
- Off Peak Residential and Small Commercial Water Heating
- Residential Lighting Efficiency
- Residential Low Income
- Residential New Construction
- Farm Efficiency
- Small Commercial Efficiency
- Equipment Replacement and Renovation Program
- Large Commercial/Industrial Audit
- Street Lighting Efficiency
- Security and Area Lighting Efficiency

Exh. Hardwick CJU-1; exh. Hardwick CJU-4 at 3.1.2, 3.2.1-3.8.4.

19. The design of Hardwick's Large C&I Audit program, like the interim program design, specifies that the customer incentives for cost-effective measures identified in the audit are to be negotiated on a case-by-case basis and are not to exceed a three-year customer payback on an aggregate package of those measures.<sup>6</sup> Exh. Hardwick CJU-4 at 3.6.1-3.6.2; exh. DPS-A at 24-25; DPS

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6. In January 1992, VPPSA and the DPS entered into an agreement to implement interim DSM program designs prior to the approval of an IRP as part of a stipulation in Docket 5603: investigation of Town of Hardwick Electric Department's tariff filing in re: rates to take effect 9/1/92 & 9/1/93, Board's Order of 2/19/93.

Brief 6/3/94 at 19.

20. The goal of the interim C&I Audit program was to achieve seventy percent penetration of the cost-effective measures found in the audit. Under the proposed Large C&I Audit program, Hardwick anticipates achieving twenty percent penetration of such measures. Exh. Hardwick CJU-4 at 3.6.2; tr. 5/3/94 at 48.

21. Hardwick has begun to implement its Farm program. Of the first seven farms participating in the program, about fifty percent of the recommended measures were installed. Tr. 5/3/94 at 33-34, 78.

#### E. Monitoring and Evaluation

22. Hardwick will develop M&E plans for each energy efficiency program that will include program tracking, process evaluations and impact evaluations. Exh. CJU-4 at pages following 3.10.2.

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### III. DISCUSSION

#### A. Load Forecast

Hardwick's IRP contains a load forecast of both demand growth (in kW) and energy consumption (in kWh) through the year 2012.<sup>7</sup> METRIX prepared the initial five-year forecast (July, 1991 through July, 1996) in 1991 using standard regression analysis techniques. Recently, VPPSA extended the trends to 2012 in order to cover a full twenty-year planning period. Finding 2.

To determine the reasonableness of the load forecast, VPPSA compared historical and forecasted energy and peak load. Using a benchmark of a two percent error over the short term, VPPSA observed that the load forecast had not begun to deviate significantly from the historical data. VPPSA assumed that Hardwick's loads most likely would not substantially deviate from the 1991 projections. Thus, VPPSA determined that these forecasts were reasonable on which to compare the supply and demand alternatives at least for the short

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7. The energy forecast was based on system load (to capture line losses) rather than retail sales. Exh. Hardwick CJU-4 at 1.1.3-1.1.4, Att. 1.1.

term and asserted that they could be used without modification for the purposes of the IRP. Finding 4; tr. 5/3/94 at 25-26.

VPPSA acknowledges that there are ways to improve forecasting techniques, but stressed that it is important to consider the cost of conducting a forecast and the value of that forecast in making resource procurement decisions over time. VPPSA states that enhancing the forecast would have made no difference in the number or nature of the DSM programs included in the IRP. Moreover, VPPSA asserts that modeling the individual drivers of the forecast, such as the influence of electrotechnologies and alternative fuel sources over time, however, is a difficult task and perhaps "beyond the scope of what a small utility running a three million dollars-a-year business can expect to reasonably do". Finding 9; tr. 5/3/94 at 70-71, 86.

Thus, keeping in mind that all forecasts are intrinsically inaccurate, that one would expect a decrease in the historical peak and energy demand due to the recent economic recession, and that a revision of the forecast at this time would not significantly affect Hardwick's plans for acquiring energy efficiency resources, VPPSA concluded that the load forecast is reasonable at least over the short term. Finding 4; tr. 5/3/94 at 65-66.

The DPS argues that Hardwick's forecast is inadequate. The Department bases its assertion on four factors:

- (1) actual data demonstrate that the forecast is biased upward;
- (2) the forecasting model is an extrapolation of a short-term forecast;
- (3) the model contains highly aggregated data; and
- (4) there is poor documentation to support the model, and it is inconsistent with the methodology specified in the Department's Twenty-Year Electric Plan;

DPS Brief at 4-5.

With respect to the first concern, the Department observes that the peak load forecast appears to be performing adequately over the first two years; however, the forecasted energy requirements are consistently above actual performance, with a dramatic divergence of almost nine percent above actual

performance in 1993.<sup>8</sup> The DPS is concerned that VPPSA's approach of extrapolating the results of the five-year forecast passes the error in forecasting energy requirements into future loads. Relying upon these exaggerated projections, asserts the DPS, could result in resource acquisitions in excess of actual requirements, which in turn pose unnecessary risks to ratepayers. Exh. DPS-A at 5-6, 9; findings 5, 6.

So if you are overprojecting energy and underprojecting peak, that will tend to push you towards acquiring not just more generation and need, but more base load generation and need which can be deleterious.

Tr. 5/3/94 at 126.

The DPS also notes that extrapolating the results also fails to consider any changes in key forecast drivers over time. Changes in the forecast variables include shifts in growth and composition of the population, changes in residential loads that are likely to follow from the implementation of appliance efficiency standards, and demand responses from changes to rates or fuel prices. Exh. DPS-A at 2, 6-7.

The DPS also observes that Hardwick's forecast model prepared by METRIX did not disaggregate energy requirements by end-use or customer class and system energy losses were also grouped with sales.

The DPS's fourth concern is that VPPSA did not provide any supporting documentation for the regression analysis (which METRIX had prepared) that it had used to forecast energy requirements. Specifically, the load forecast does not identify the seven variables used in the regression, nor does VPPSA offer an explanation for projecting those variables into the future. A related issue is that the load forecast does not conform to the requirements of the DPS's Twenty-Year Electric Plan, pages III.1-15 and III.1-16, regarding

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8. VPPSA asserts that by taking into account the fuel-switching installation at Hazen Union High School, the difference between the base forecast and the actual energy requirements for the year 1993 diminishes to about six percent. The DPS contends that although the fuel-switching installation may serve to diminish the forecast error, a six percent error, which appears to be increasing over time, remains a concern. Tr. 5/6/94 at 39, 65, 136, 140.

methods, information, and supporting documentation. Exh. DPS-A at 2-3, 8.

The DPS recommends that Hardwick fully realize the limitations of its load forecast when undergoing any resource acquisition decisions. The DPS also recommends that Hardwick limit its reliance on the forecast to identifying avoided costs for determining cost-effective T&D improvements and energy efficiency resource acquisition strategies. Using the forecast in this application will prevent any delay in the capability development of these resources.<sup>9</sup> Finally, the Department recommends that Hardwick file specific plans and a schedule for reviewing alternatives to their current forecast approach. Exh. DPS-A at 9; tr. 5/3/94 at 156-157.

Although it is Hardwick's responsibility to file a reasonable load forecast as part of its IRP, I am sympathetic to VPPSA's concern that it is important to consider the cost of reworking the load forecast for this round of the IRP approval process. At this time, I do not recommend requiring Hardwick to modify its load forecast, despite the fact that I share the Department's concerns about Hardwick's load forecast. I am especially concerned that the error in Hardwick's energy requirements forecast appears to be increasing each year. Reliance upon such a forecast creates a risk for ratepayers.<sup>10</sup>

I am also concerned that Hardwick's load forecast is an extrapolation of

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9. The DPS also notes that using the forecast for calculating avoided costs may be acceptable because the projected peak demand for years 1991 and 1992 are fairly close to actual performance and utilities have the opportunity to acquire DSM resources incrementally. Tr. 5/3/93 at 156-157.

10. VPPSA did make an important point: a certain degree of uncertainty always accompanies a given load forecast and therefore, actual energy and peak load will never match the forecast. VPPSA offered, as examples of this uncertainty, Lyndonville's loss of an industrial customer which had a ten percent impact of its system load, and Ludlow's yearly load which varies with snow-making demand. Tr. 5/6/94 at 66. These examples, however, further demonstrate the value of conducting uncertainty analysis in an IRP in order to understand such variations.

the three-year-old data. Extrapolation assigns values based upon a historical relationship of variables that may very well change over time.

Hardwick's forecast does not incorporate end-use information. Although a regression analysis-based model is frequently used to predict future trends, end-use modelling can further assist a utility in understanding its "market". It provides specific information about the utility's customer-response to energy efficiency programs within the service territory.

Hardwick's IRP also does not contain an uncertainty analysis of the load (except for the ninety percent confidence interval placed on the maximum peak used in the original METRIX forecast). Such an analysis would test the robustness of Hardwick's least-cost resource portfolio.

I note that Hardwick's IRP does not call for any additional supply resource acquisition until 1998.<sup>11</sup> Exh. CJU-5; tr. 5/3/94 at 176. Moreover, VPPSA plans to revisit Hardwick's forecasting methodology in the filing of its next IRP in 1996, and stated that Hardwick would not be relying upon this forecast for any long term supply purchases. With that understanding, I recommend that the Board find Hardwick's load forecast acceptable for this round of IRP approval, under the condition that Hardwick limit its reliance on its forecast to identifying avoided cost for determining cost-effective T&D improvements and energy efficiency resource acquisition strategies. For future IRPs, I recommend that the Board require Hardwick to utilize more refined load forecasting techniques such as those recommended by the DPS, including the consideration of various scenarios and end-use modeling, and to better conform to the requirements of the Department's Twenty Year Electric Plan. Exh. DPS-A at 8.

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11. Hardwick's post-DSM supply plan, Exh. CJU-5, and the supply-only plan contained in the IRP, at 2.3.4, both demonstrate that in 1993 Hardwick contracted for additional power for future years. Among those contracts include agreements with Niagara Mohawk Power Corporation ("NIMO") and Northeast Utilities for those purchases beginning in 1996. VPPSA, on behalf of Hardwick, filed G.O. 45 notices of the execution of those contracts with the Clerk of the Board on July 30, 1993. Tr. 5/3/94 at 174-176.

B. Supply-Side Resources

The DPS states that Hardwick's supply plan contains a number of flaws that prevent the IRP from being a least-cost plan. The Department's concerns include:

- (1) VPPSA did not use economic criteria in selecting resources to meet Hardwick's operating reserve requirements, and Hardwick's supply plan is not a least-cost supply-only plan. The result is a supply plan showing a significant excess of supply resources;
- (2) the improper modeling and lack of documentation of the McNeil wood and natural gas-fired plant;
- (3) the omission of the DSM programs from the IRP's Base Case supply plan;
- (4) unrealistic capacity sales prices; and
- (5) poor overall documentation.

This section addresses each of the Department's concerns in turn.

In a recent IRP approval proceeding, Lyndonville and the DPS agreed to eleven changes for determining the avoided costs to be used for the final design of its energy efficiency programs. Some of these issues apply to supply planning. The DPS believes that Hardwick's supply plan has conformed to all of those supply planning changes except one. The non-conforming issue is a requirement that VPPSA use economic criteria in order to select the amount of gas turbines ("GT") in Hardwick's supply plan. The DPS asserts that VPPSA selected the amount of GT capacity (which consists of Burlington GT and Berlin GT entitlements) to meet operating reserve needs before conducting an economic weighing of alternatives as part of a least-cost planning process. The result, according to the DPS, is that Hardwick has purchased more than double its required spinning reserve, and that one of the gas turbines is a poor source for meeting Hardwick's non-spinning reserve requirement.<sup>12</sup>

In addition to spinning reserve, Hardwick must also maintain non-

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12. To meet its required 0.2 MW of spinning reserve, Hardwick has purchased 0.3 MW of Burlington GT and 0.2 MW from Green Mountain Power Corporation's ("GMP") Berlin GT. Exh. DPS-A at 14.

spinning reserve.<sup>13</sup> The DPS argues that the Burlington GT also serves as a poor source of ten-minute non-spinning reserve in comparison to Hardwick's Stony Brook entitlement. Exh. DPS-A at 14-15; exh. DPS-B at 1.

The DPS believes that Hardwick may be able to meet much and possibly all of its operating reserve requirements more economically from its existing resource mix. This strategy would remove the need of some of the GT capacity. Exh. DPS-A at 16.

A related issue is the DPS's assertion that Hardwick's supply plan is not a least-cost supply-only plan, thereby showing a significant excess of supply resources. The DPS notes that Hardwick's capacity needs exceed its capability responsibility ("CR") throughout its planning horizon.<sup>14</sup> In the years 1994 through 2014, Hardwick will exceed its CR by between 500 and 2400 kW. Finding 8.

The DPS also asserts that Hardwick appears to have a substantial excess of baseload sources. For example, NIMO, one of Hardwick's several baseload sources, represents 70-80 percent of Hardwick's anticipated peak. The DPS also notes that Hardwick is maintaining its CR partly through additional purchases from the NIMO proxy source. Exh. DPS-A at 16, 21; DPS Brief of 6/3/94 at 13.

The DPS argues that Hardwick must correct the deficiencies of its supply plan. Otherwise, a consequence of a suboptimal resource mix, such as

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13. Hardwick must maintain 0.2 MW of ten-minute non-spinning reserve, which can be used to meet its additional requirement of 0.16 MW of 30-minute non-spinning reserve. Exh. DPS-A at 15.

14. The New England Power Pool ("NEPOOL") determines the amount of generating capacity that each member must have to meet specified reliability objectives. The Vermont Electric Power Company ("VELCO"), as Vermont's member to NEPOOL, informs each of the state's regulated electric utilities of its CR. The CR is the amount of capacity each utility must maintain. It consists of the utility's peak load and a capacity reserve margin. The reserve margin ensures system reliability, given fluxes in power from scheduled maintenance, emergency outages, and unforeseen loads.



Hardwick's, is that it could distort avoided cost estimates. Exh. DPS-A at 16, 18.

The second of the DPS's issues regards VPPSA's modeling of the McNeil wood and gas-fired plant as a dual fuel capability throughout Hardwick's planning horizon. Based on VPPSA's fuel price assumptions, operating McNeil with natural gas becomes more costly than wood in the year 2000 and beyond. VPPSA, however, models McNeil using gas as the fuel choice during the summer months for the rest of the planning horizon. No documentation accompanies the model to explain this assumption. Exh. DPS-A at 19.

The DPS argues that Hardwick must either demonstrate the reasonableness of modeling McNeil in this way or correct the modeling and re-evaluate the supply plan.

Third, the Department observes that the DSM programs are omitted from the IRP's Base Case supply plan, demonstrating that the plan is not based on least-cost planning principles. The Department recognizes that Hardwick attempted to address this problem by preparing a modified Base Case supply plan. That supply plan, which was filed with the DPS on April 8, 1994, incorporates the cost-effective DSM programs.<sup>15</sup> Nevertheless, the Department notes that it received Hardwick's post-DSM supply plan only one day before the DPS was to file its pre-filed testimony. In addition, the Department contends that by not providing the post-DSM supply plan as part of the IRP filing, Hardwick did not meet one of the basic components of an IRP, as described in Chapter III of the Department's Draft Twenty-Year Electric Plan. Exh. DPS-A at 12; DPS Brief of 6/3/94 at 12, 18.

Fourth, the DPS asserts that VPPSA's modeling of capacity sales using prices that remain fixed over time is unrealistic. The Department does not believe that today's problems of selling capacity are permanent. A more realistic modeling approach that assumes rising market prices particularly in the later years would help to reduce Hardwick's excess capacity problem. Exh.

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15. This information was filed with the Board on May 9, 1994 as Exhibit CJU-5 in this Docket.

DPS-A at 20-21.

Finally, the DPS is concerned with the rather poor supporting documentation of the supply plan. The supply section does not adequately describe the assumptions, analyses, results, and conclusions of the supply plan. In addition, the Department finds it difficult to determine whether Hardwick has conformed with the modeling changes, such as updated cost escalators, which were agreed to by VPPSA in Docket 5270-LYND-1.

Despite these objections, the DPS recommends that the Board accept Hardwick's supply plan as modeled by VPPSA for this round of IRPs; the DPS's recommendation is subject to three conditions. First, the Board should consider the issue of excess generation capacity in its review of VPPSA's supply model. Second, the Board should consider whether to investigate the VPPSA model as an appropriate model for long-term planning. The excess capacity may be a warning signal of uneconomic resource planning. Third, any Board order approving Hardwick's IRP should contain language directing Hardwick to use the principles of least-cost integrated planning as a guide for all future supply resource acquisitions. Exh. DPS-A at 23; tr. 5/3/94 at 163-164.

I am concerned that Hardwick's IRP does not fully conform to the principles of least-cost integrated resource planning. Hardwick's supply plan as filed in the IRP was not adjusted to incorporate the impacts of the DSM programs. Additionally, it appears that Hardwick did not perform economic analyses to determine how to best meet operating reserve needs, and Hardwick's supply plan demonstrates an excess of supply resources.

I do note, however, that Hardwick is committed to use least-cost planning principles in all future supply resource acquisition decisions. Moreover, Hardwick attempted to correct its omission of DSM programs from the IRP Base Case supply plan by filing a modified Base Case supply plan with the DPS for its review, albeit a day before the Department's prefiled testimony was due. Hardwick also attempted to comply with the Board's directive in the Docket 5270-LYND-1 Order of November 30, 1993. *Most importantly*, VPPSA testified that complying with the Department's concerns raised in both the

load forecast and supply areas would not affect any DSM allocation decisions between now and the next IRP filing. Findings 9, 10; tr. 5/3/94 at 219, 240.

I agree with the Department that a utility, occasionally faced with making resource procurement decisions that it may not have anticipated making, needs to rely upon its IRP for guidance in making those decisions. Thus, a utility should make every effort to ensure that its IRP is in reliable working condition. DPS Reply Brief at 3. Moreover, Hardwick should be on notice that in any future case involving any resource procurement decision or HED's rates, the utility's power costs will be evaluated to determine whether the utility followed least-cost planning principles and whether a portion of those costs could have been avoided if the utility had pursued more cost-effective energy efficiency programs.

I therefore recommend that the Board accept the Department's recommendation and find Hardwick's supply plan for this round of the IRP approval process reasonable, subject to the DPS's three conditions (at 22). I also recommend that the Board direct Hardwick to amend its supply plan in future IRPs by addressing each of the Department's five concerns (at 18).

#### C. Transmission and Distribution

The T&D component of the IRP consists of an introductory description, a copy of the agreement between Hardwick and the Department which outlines the parameters for a comprehensive, long-term study of Hardwick's T&D system, and a "Construction Work Plan, April 1990 - April 1992", dated April 24, 1990. Hardwick stated that it does not plan to make any T&D investments until the comprehensive study is complete. Finding 12.

The DPS commented on the section's limited documentation, which prevented the Department from conducting a complete review of that section. The DPS was also concerned that the planned T&D system study has yet to be completed, delaying benefits to Hardwick's ratepayers, even though the agreement between the Department and Hardwick specifies a completion date of November 1, 1993. Finding 11; exh. DPS-A at 28.

The Department recognizes that Hardwick has demonstrated some progress

in completing the comprehensive study. The mapping of its distribution system, a prerequisite for the study, was about half complete at the time of the hearing. Hardwick anticipated completing the mapping within six weeks of the hearing. Hardwick is also committed to completing the T&D study within three months of the hearing in this docket. Finding 13.

The DPS recommends that the Board accept Hardwick's T&D section of the IRP under three conditions. The Board should direct Hardwick: (1) to complete the optimization study expeditiously; (2) to provide the Department with an updated schedule for completing the T&D study, the budget for the study, and a copy of the contract between Hardwick and the consultant that is performing the study; and (3) to consult with the DPS before beginning the actual study in order to discuss the specifics of that study. DPS Brief at 26.

Hardwick did not raise any objections to the DPS's requests. Hardwick stated that it would be willing to discuss the details of the study with the DPS. Tr. 5/3/94 at 102.

I recommend that the Board find Hardwick's T&D component of its IRP, modified by the Department's first two conditions, acceptable for this round of the IRP approval process. The third condition is moot, given that the study is already under way. The Board should direct Hardwick to file the updated schedule by November 1, 1994. I also recommend that the Board direct Hardwick to discuss the specifics of the study with the DPS prior to its completion. Finally, I recommend that the Board direct Hardwick to improve the documentation of the T&D component for all future IRPs. Finding 14.

#### D. Demand-Side Resources

Hardwick's IRP includes energy efficiency programs for its residential, commercial, industrial, and farm customers. Hardwick maintains that these energy efficiency programs represent the optimum mix of comprehensive and cost-effective efficiency opportunities for its service territory. Exh. Hardwick CJU-4 at 3.1.2.

The DPS criticizes the designs of several of Hardwick's proposed energy

efficiency programs filed in the  
IRP -- the Large C&I program, the Farm program, three "lost opportunity"<sup>16</sup>  
programs (specifically the Residential New Construction program, the Non-Act  
250 C&I New Construction program, and the Equipment Replacement and Renovation  
program)<sup>17</sup>, and the Small C&I program. Each of those programs under dispute  
is discussed below.

1. Large Commercial and Industrial Program

The design of Hardwick's Large C&I Audit program, filed in the IRP, is  
nearly identical to HED's interim program design that was part of a  
stipulation in Docket 5603. Both designs specify the use of negotiated  
incentives. The Department had agreed to support the use of negotiated  
incentives in Docket 5270-LYND-1. The DPS no longer supports this type of  
incentive structure.<sup>18</sup> Finding 19; exh. DPS-A at 26.

The DPS believes that the effort required of the customer to negotiate  
the incentive and the attendant uncertainty create a barrier to customer  
participation. The DPS asserts that, for Hardwick, negotiated incentives may  
lead to lower participation rates, equity concerns among customers, and  
unnecessary negotiation expenditures. The DPS asserts that the VPPSA member  
utilities that have used negotiated incentives have not acquired the target  
level (70 percent) energy efficiency resources identified in the large C&I

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16. "Lost opportunities" refer to the lost cost-effective  
energy efficiency resources foregone because it is not cost-  
effective or physically possible to acquire those resources at a  
later date. Docket 5270, Board Order of 4/16/90 at I-25.

17. Hardwick's IRP contains four lost opportunity programs  
-- Residential New Construction program, Act-250 New  
Construction program, non-Act 250 C&I New Construction program,  
and C&I Equipment Replacement and Renovation program. The DPS  
raises concerns about all of the lost opportunity programs except  
for the Act-250 New Construction program.

18. In Docket 5270-Lynd-1, the Department had supported the  
use of negotiated incentives provided that the incentive created  
a customer payback period of no more than three years.

audits. The DPS states that these results demonstrate that the negotiated incentives are ineffective. Exh. DPS-A at 26; DPS Brief at 19-20; tr. 5/3/94 at 216.

The DPS recommends that the Board reject the program plan, and require Hardwick to redesign the program to include a customer payback incentive that is consistent with other Vermont utilities' incentive structure for large C&I retrofit program participants, i.e., in the range of one to two years. DPS Brief at 20, 27.

VPPSA acknowledges that negotiating incentives requires more structure and follow-up. Instead of changing the incentive structure, however, VPPSA designed the program to turn the follow-up work over to an energy services company. VPPSA would continue to provide the contractor support to ensure that the measures to be implemented remain cost-effective and to identify the incentives Hardwick should offer to buy down the customer's investment to a minimum three-year payback. Tr. 5/3/94 at 49.

I share the DPS's concern that Hardwick's program may not be securing energy efficiency resources identified in the large C&I audits. I refer to Hardwick's response to its failure to achieve its penetration objective for securing cost-effective measures identified in the audit under the interim C&I Audit program. Instead of modifying the incentive structure to increase the likelihood of achieving its penetration objective, Hardwick adjusted the penetration objective for the IRP's proposed C&I Audit program. Under the interim C&I Audit program, the penetration objective was seventy percent; under the proposed C&I Audit program in the IRP, the penetration objective dropped to twenty percent. VPPSA justified the change by asserting that its original seventy percent penetration objective had been extremely unrealistic. Finding 20; tr. 5/3/94 at 216.

I recommend that the Board require Hardwick to redesign the program to include a two-year pay-back incentive structure and file the redesign of this program by November 1, 1994. This will provide Hardwick an opportunity to determine if a higher incentive level results in greater measure acceptance by its customers.

## 2. Farm Energy Efficiency Program

Hardwick's audit-driven Dairy Farm Energy Conservation program is designed to identify and deliver cost-effective energy efficiency measures to the 28 dairy farms within its service territory. The program proposes an incentive cap as a means to limit its financial contribution for any one farm. The proposed cap is a maximum of 42 months of estimated measure savings for all identified cost-effective energy efficiency measures. Thus, Hardwick's incentive is to buy down the customer costs of measures with five-year paybacks to 18 months. This incentive structure differs from Hardwick's interim Farm program design, which consisted of an incentive equal to an 18-month buydown but did not include the 42-month cap. Exh. DPS-A at 27-28; DPS Brief at 20; tr. 5/3/94 at 51.

Hardwick's proposed incentive structure is similar to the incentive structure proposed by Lyndonville for its Farm program. Lyndonville proposed to limit its financial contribution for any one farm to a maximum of 42 months of estimated savings. The effect of this cap is that measures with simple paybacks of more than 60 months will have longer than 18-month paybacks for the farm customer. The Board rejected this proposal on the ground that it was inconsistent with 30 V.S.A. §218b.<sup>19</sup> Docket 5270-LYND-1, Board Order of 11/30/93 at 23, 25, 39; DPS Brief at 20.

The Hearing Officer in that docket did recognize, however, Lyndonville's concerns over large investments for individual farm customers and noted that Lyndonville's proposed cap reduced but did not eliminate the incentive it

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19. 30 V.S.A. §218b states:  
Each Vermont electric distribution utility shall develop and implement comprehensive energy efficiency programs for its dairy farm customers. Such programs shall include all program measures that the public service board determines will be cost-effective as part of the utility's least cost integrated plan. Utilities shall file such proposed program by August 1, 1991. The board shall require each utility to deliver approved program measures to farm customers as rapidly as possible thereafter; taking into consideration the need for these services, utility financial constraints, and cost-effective delivery mechanisms.

would pay for measures with paybacks of greater than five years. The Hearing Officer concluded that it may be appropriate to limit financial incentives and require the customer to pay for a larger percentage of the investment:

Lyndonville's proposed incentive cap may be an appropriate way to allocate the costs of measures without significantly impairing program comprehensiveness or implementation rates and, thus, result in the acquisition of all cost-effective efficiency resources.

5270-LYND-1, Order of 11/30/93 at 25-26.

Although the Hearing Officer determined that Lyndonville's proposed incentive cap of 42 months was too limiting,<sup>20</sup> the Hearing Officer recommended, and the Board approved, an incentive structure consisting of an incentive cap equal to a maximum of 78 months. Exh. DPS-A at 27.

Hardwick reports that its program has been relatively successful in acquiring cost-effective resources. Of the first seven farms participating in its program, it has achieved fifty percent penetration of the audit recommendations. Hardwick also noted that changing the program's incentive plan would be inequitable to the farm customers who have already participated in the program. Finding 21.

The DPS questions why Hardwick advocated a reduction in the incentive cap if only a few measures would be lost in the change. Additionally, the DPS asserts that the initial success does not demonstrate that Hardwick's program design is sufficient to acquire all cost-effective resources available. The DPS argues that using an incentive cap will result in less resources being acquired from a site, creating lost opportunities. Furthermore, the DPS suggests that Hardwick provide additional incentive amounts for the unimplemented, unaccepted cost-effective measures identified at the farms that have already been audited. Exh. DPS-A at 29; DPS Brief at 20-21.

I commend Hardwick for its initial success at achieving a fifty percent penetration rate of cost-effective energy efficient measures. However, Hardwick's penetration rate is derived from activity at only one quarter of

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20. Some cost-effective measures have eight-year and ten-year pay-back periods. 5270-LYND-1, Order of 11/30/93 at 23.



the eligible farms. I question whether Hardwick can continue to achieve or even exceed this penetration rate with the proposed incentive cap. I also share the DPS's concerns that a downward adjustment of the incentive cap may create lost opportunities.

I recommend that the Board approve Hardwick's proposed farm program, adjusted with an incentive cap that is consistent with the Board's Order of 11/30/93 in Docket 5270-LYND-1. The maximum incentive level is to equal or exceed the equivalent of 78 months of customer savings.

### 3. Residential New Construction

Hardwick's Residential New Construction program is identical to that filed by Lyndonville as a compliance filing to the Board's Order of 11/30/93 in Docket 5270-LYND-1.<sup>21</sup> The program provides for an incentive of fifty percent of the cost of any hard-wired compact fluorescent fixture (not to exceed \$30 per fixture) and a \$75 rebate (approximately twenty percent) toward the cost of a home energy rating review to be performed by Energy Rated Homes of Vermont. Exh. Hardwick CJU-4 at 3.3.11; exh. DPS-A at 31.

The DPS asserts that this program is not comprehensive and will not capture all cost-effective resources at the time of construction. The Department notes that Hardwick's proposed program is similar to other Vermont utilities' new construction programs that have not been successful. The DPS is also concerned that Hardwick's program does not discuss the new construction program design currently being implemented by Washington Electric Cooperative ("WEC"), which was approved by the Board on 4/4/94 in Docket

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21. The Board's Order of 11/30/93 in Docket 5270-LYND-1 required Lyndonville to submit a program design that specifically references the assessment fee Residential New Construction program being developed jointly by Washington Electric Cooperative and the DPS. (See the following footnote). Lyndonville's compliance filing was submitted to the Board on December 30, 1993. Docket 5270-LYND-1, Order of 11/30/93 at 28, 38-39.

5703.<sup>22</sup> Exh. DPS-A at 31-32.

The points raised by the DPS are troubling. Approving a non-comprehensive DSM program may lead to the undesirable outcome of cream-skimming.<sup>23</sup> Moreover, I am concerned that Hardwick's program is similar to programs being implemented by other utilities, which, according to the DPS, are not achieving their anticipated savings, rather than to WEC's program. Docket 5270-LYND-1, Board's Order of 11/30/93 at 27-28.<sup>24</sup> The program currently being implemented by WEC appears to be a very cost-effective strategy for other Vermont utilities to undertake for securing energy efficiency resources in the new construction sector. Once WEC has gained experience with its program and results are available for other utilities to review, it may be appropriate for the Board to require other utilities to adopt it.

I therefore recommend that the Board approve Hardwick's own proposed program but require it to closely monitor the impacts of its program as well as WEC's progress in implementing its Residential New Construction program. I recommend that the Board direct Hardwick to report its analysis and discuss

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22. That program design, which was developed jointly by WEC and the DPS, consists of a comprehensive energy rating of the entire house and a cost-effectiveness test based on electrical use and savings. Participation in the program is mandatory for all new residential construction that anticipates electric service from the Cooperative. Each applicant for a connection to WEC's grid must pay an assessment fee, estimated to be \$300. The fee is designed to cover the actual cost of the energy rating and consultation process. It will also serve to encourage builders and WEC customers to fully participate in the program. A builder that meets WEC's compliance standards is eligible for an incentive payment of \$750. This amount is half of the estimated incremental cost of compliance for an average home.

23. Cream-skimming occurs when programs do not include measures that are cost-effective at the time other measures are installed but become non-cost-effective for installation at a later date. Docket 5270, Board's Order of 4/16/90 at 47.

24. See, Docket Nos. 5270-GMP-3, 5270-VGS-2, 5270-WEC-2, 5270-CUC-2, and 5270-CV-1&3.

whether it should modify its program to conform to WEC's program in its DSM annual report to be filed in March of 1995.

#### 4. Non-Act 250 C&I New Construction

Hardwick plans to work with communities that have planning and zoning laws or ordinances in order to establish minimum standards for electrical equipment. The DPS does not support this program, noting that Hardwick has not defined those standards, and does not specify a course of action for communities without planning and zoning procedures. Exh. DPS-A at 32.

I recommend that the Board require Hardwick to file a compliance filing that addresses both of the DPS's concerns. That compliance filing should identify standards for specific electrical equipment and describe in detail a New Construction program it plans to implement for communities without planning and zoning procedures. The description should include information in a format similar to the DSM program presented in Hardwick's IRP, such as start-dates, implementation schedule, per year estimates for the number of installations, program and system costs, revenue erosion, capacity, energy, and system savings, and system and societal impacts.

#### 5. Equipment Replacement and Renovation Program

Hardwick's proposed Equipment Replacement and Renovation program offers a rebate that approximates the incremental cost between high-efficiency and standard equipment. Hardwick plans to establish and maintain a list of high-efficient equipment that qualify for incentives. Exh. CJU-4 at 3.5.3; exh. DPS-A at 33.

The DPS supports the program but recommends that it include a commitment to "piggyback" with the mature programs being implemented by GMP and Central Vermont Public Service Corporation ("CVPS"). The DPS notes that the development of trade ally relationships -- a necessary prerequisite for moving the market -- is most likely to be successful if approached on a statewide basis. Exh. DPS-A at 33.

I recommend that the Board approve Hardwick's Equipment Replacement and Renovation program and direct Hardwick to contact CVPS and GMP to discuss the

possibility of implementing its program in conjunction with theirs. I recommend that Hardwick report on its discussion and any plans it may have for a cooperative implementation plan in its DSM annual report.

#### 6. Small C&I Program

Hardwick's Small C&I program is based on Lyndonville's program. Although Hardwick's IRP states that HED plans to defer the implementation of this program until "a more opportune power market makes the program attractive" and until results of Lyndonville's experience with the program have been analyzed, Hardwick began implementation of the program in June 1994. Hardwick plans to pay the cost of the audit and to provide a rebate of up to twenty-five percent of the cost of the measures. Tr. 5/3/94 at 55, 223; exh. CJU-4 at 3.5.1; exh. DPS-A at 34.

The DPS notes a number of market barriers exist that make securing energy efficiency resources from this customer sector very challenging. Many customers are tenants, are known to move or remodel frequently, are small electric users, and have limited cash flow. The Department stresses that the program must be designed to overcome these barriers. Exh. DPS-A at 35.

The DPS acknowledges that Hardwick's program attempts to incorporate some of the features of GMP's Small C&I Retrofit program which is known to be successful. The Department does not support the program, however, noting that the incentives are inadequate and measure offerings limited. Id. at 36.

Although I recognize that the DPS has raised a valid concern, I conclude that Hardwick should be given the opportunity to demonstrate that its program design can achieve an adequate penetration rate of energy efficiency measures. I recommend that the Board approve Hardwick's program design. In addition, the Board should require HED to pay particular attention to appropriate incentive levels as it monitors the performance of the Small C&I program. Hardwick should specifically address this program design in its 1994 DSM annual report.

#### E. Monitoring and Evaluation

Hardwick plans to develop M&E plans for each energy efficiency program

that will include program tracking, process evaluations and impact evaluations. Finding 22.

Monitoring and evaluation studies are an essential component of the DSM program implementation process. As noted in a number of previous Board orders, detailed monitoring and evaluation plans should be in place before program implementation begins.<sup>25</sup> I recommend that the Board require Hardwick to file the details of its monitoring and evaluation plans by January 1, 1995.

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#### IV. OTHER ISSUES

##### A. Annual DSM Reports

In order to monitor the implementation results and cost-effectiveness of utility energy efficiency programs, the Board has required utilities to file annual DSM reports. In the fall of 1992, the Board approved a standard report format developed by several utilities, the DPS, and the Conservation Law Foundation ("CLF").<sup>26</sup>

The Board is entering its third year of receiving DSM annual reports from Vermont utilities. On March 1, 1993, CVPS, GMP, WEC, Citizens Utilities Company ("CUC"), and Burlington Electric Department ("BED"), all filed their first annual DSM reports using the Board's approved format.<sup>27</sup> On March of 1994, CVPS, GMP, WEC, CUC, BED, VGS, the Vermont Marble Power Division of OMYA, Inc., the Village of Northfield Electric Department, and Lyndonville

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25. See, Docket Nos. 5270-GMP-3, Order of 9/5/91 at 56-58; 5270-CV-3, Order of 5/20/91 at 81-82; 5270-BED-1, Order of 10/17/91 at 53-54; 5270-VGS-2, Order of 10/23/92 at 64-65; 5270-CUC-2, Order of 2/26/93 at 71-74; 5270-LYND-1, Order of 11/30/93 at 30.

26. The participating utilities were CVPS, GMP, CUC, and WEC. See, Order of 12/3/92 in Docket Nos. 5270-GMP-3, 5270-CV-3, 5270-CUC-2, and 5270-WEC-2.

27. On July 27, 1993, and July 28, 1994, the Board held informal workshops to discuss improvements to the reporting format.

filed DSM annual reports. The third set of reports is due in March 1995.

I recommend that the Board require Hardwick to file an annual DSM report on March 1st of each year, with its first report due on March 1, 1995. I further recommend that the Board require Hardwick to use the Board's approved annual DSM report format (with the changes agreed upon in the July 1993 and July 1994 workshops) or, in the alternative, to file its own proposed annual DSM report format by January 1, 1995.

#### B. Hardwick's Next IRP

The Board requires utilities to file an IRP every three years.<sup>28</sup> METRIX, on behalf of Hardwick, filed Hardwick's IRP on June 18, 1991. On April 30, 1993, Hardwick filed a revised IRP after rejoining VPPSA. VPPSA filed revisions on June 3, 1993 and March 7, 1994.

Filing a new IRP in 1994 would not allow Hardwick to incorporate changes based on experience gained from the implementation of its energy efficiency programs. A new IRP filing in 1997 may result in too long a delay to incorporate changes to its load forecasts and avoided costs based on new developments since 1991.

I recommend that the Board require Hardwick to file its next IRP on June 1, 1996, (three years after Hardwick had filed a revised IRP and to file future IRPs on a three-year cycle following that date). By that time, Hardwick will have had more than a year of DSM program experience, its T&D study will have been completed, and recommendations contained in this proposal for decision can be integrated into its new plan.

#### V. CONCLUSION

Based on the evidence before me, I conclude that Hardwick's IRP, with the modifications recommended above, will be a least-cost plan for providing electric service to its customers within the meaning of the Board's Orders of 4/16/90 in Docket No. 5270, 3/13/91 in Docket No. 5270 Phase V, and

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28. See, Docket No. 5270, Order of 4/16/90, Vol. IV at 51; Docket No. 5270 Phase V, Order of 3/13/91 at 28.

30 V.S.A. §218c.

This Proposal for Decision has been served on all parties to this proceeding in accordance with 3 V.S.A. §811.

VI. PARTIES' COMMENTS ON THE PFD

On September 21, 1994, a draft Proposal for Decision ("PFD") was served on all parties to this proceeding in accordance with 3 V.S.A. §811. The parties to this docket were requested to file any comments on the PFD by October 5, 1994. VPPSA filed its comments on October 4, 1994, and the DPS filed its comments on October 5, 1994. Hardwick did not file any comments.

Both VPPSA and the DPS raised concerns about the PFD, but neither party requested oral argument.

The only modifications that I have made to the PFD were to correct for the errors that VPPSA had described in Item 6 on page 5 of its comments. I corrected the typographical error in the second paragraph on page 4 and Finding 15 on page 10 by replacing the figure \$619,980, the total societal benefits, with the figure, \$618,980.

A second error was to replace the figure \$619,908, cited in the first paragraph on page 4 with the amount \$74,630, the total system savings in 1998. To clarify the meaning of that paragraph and the subsequent paragraph, I made the following modifications to the text:

...For the year 1998 alone, Hardwick estimates that its energy efficiency programs will save 1,930 MWh and reduce HED's capacity needs by 440 kW. The dollar value of these savings is \$74,630 (in 1994 dollars).

In order to achieve total savings through the year 1998 and beyond, Hardwick plans to invest almost \$364,100 in nominal dollars over the five-year life of the programs....

(Emphasis is added to highlight the changes).

I have not modified the PFD based on the parties' more substantive comments. I have left those issues for the Board's consideration. The changes I did make were to correct the errors that were inadvertent and are not "adverse to a party to a proceeding". Accordingly, 3 V.S.A. §811 does not require recirculation to the affected parties.

I therefore recommend that the Board approve this PFD, as now set out above.

Dated at Montpelier, Vermont, this 28th day of October, 1994.

s/Kari T. Dolan  
Kari T. Dolan  
Hearing Officer



VII. BOARD DISCUSSION

The parties' comments raise ten issues, each of which is discussed below. In addition, we include some observations regarding the overall burden experienced by the DPS, VPPSA, and Hardwick during this investigation.

The Board hereby adopts the Hearing Officer's PFD, as supplemented by the modifications below.

Issue One: Load Forecast:

The DPS states that the PFD's recommendation, page 18, that requires Hardwick to utilize more refined load forecasting techniques for future IRPs is too general. The DPS recommends that Hardwick file a plan and schedule for reviewing and adopting alternatives to its current forecasting approach by June 1, 1995.

The evidence indicates that Hardwick will not be relying upon its forecast as filed in the IRP for any long-term purchases. We conclude that Hardwick does not need to provide an interim filing prior to the filing of its next IRP on June 1, 1996.

Issue Two: Supply Resources:

The DPS recommends a word change on page 22 of the PFD to direct Hardwick to use IRP principles "in" (as opposed to "as a guide for") all future supply resource acquisitions. We are not persuaded that a change in wording is necessary. Paragraph 5 of our Order, below, directs Hardwick to use least-cost planning principles ". . . in all future supply resource acquisitions".

Issue Three: The Post-DSM Supply Case:

VPPSA states that paragraph 5 of the draft Order appears to require Hardwick to conduct costly economic analyses to justify its operating reserve requirements that may have little additional value to the IRP.

We have amended that paragraph to reflect VPPSA's concern. Certainly, the cost of such studies should be balanced with the value that the analysis is expected to produce. Nonetheless, we still emphasize the necessity for Hardwick to provide a clear description of its plan to meet operating reserve requirements.

Issue Four: Large C&I DSM Program:

VPPSA takes exception to the Hearing Officer's recommendation to direct Hardwick to use two-year payback incentives rather than negotiated incentives in implementing its Large C&I program. VPPSA argues that the PFD contains no finding of fact to support the Hearing Officer's recommendation.

We conclude that the discussion on pages 26-28 regarding Hardwick's experiences with its interim Large C&I program establishes sufficient evidentiary basis for the Hearing Officer's recommendation. Hardwick, and other VPPSA members, have had over two years of experience with negotiated incentives with large C&I customers, with limited success. To give Hardwick sufficient time to prepare this filing, we will modify the filing date for the redesign of this program to January 6, 1995.

Issue Five: Farm DSM Program:

VPPSA does not agree with the Hearing Officer's recommendation to require Hardwick to redesign its Farm program by replacing the 42-month incentive cap with an incentive cap equal to a maximum of 78 months. VPPSA states that the Hearing Officer questions, without citing any evidence, whether Hardwick can continue to achieve fifty percent penetration of recommended measures using a 42-month incentive cap. VPPSA recommends approval of its original program design, noting that the cap has been in place since Hardwick began implementing the program, Hardwick has achieved the 50 percent penetration rate using the cap, the DPS did not provide any information to compare Hardwick's implementation rate with other Vermont utilities' programs, and a cap equivalent to a maximum of 78 months will increase the cost of the program.

The DPS asserts that Hardwick has not adhered to the terms of the stipulation in the prior rate case, Docket No. 5603. In that stipulation, according to the DPS, Hardwick agreed to implement a Farm program that did not contain an incentive cap of any duration. Whatever the merits of the DPS's observations, with the approval of this IRP, that issue is now moot. On a forward looking basis, the DPS recommends that the Board approve the design of Hardwick's Farm program with no less than a 78- month incentive cap, consistent with the Board's Order of 11/30/93 in Docket No. 5270-LYND-1.

Regarding Hardwick's comments, we are not convinced that the fifty percent acceptance rate of recommended measures will persist, particularly in light of the fact that this acceptance rate is derived from activity at only a quarter of the eligible farms. Moreover, we concur with the DPS that a fifty percent acceptance rate is not adequate. The Legislature has specifically directed Vermont utilities to provide comprehensive energy efficiency programs to dairy farm customers that include all cost-effective measures. 30 V.S.A. § 218b. We accept the Hearing Officer's recommendation in this matter.

Issue Six: Residential New Construction DSM Program:

The DPS argues that the Hearing Officer's recommendation that Hardwick should closely monitor the performance of its program and WEC's program is

insufficient. The DPS recommends that Hardwick be required to analyze and report on its residential new construction activities, and on the potential impact of adopting WEC's program, by January 6, 1995.

We accept the Department's suggestion that Hardwick file a report that specifically compares its program to WEC's. However, we do not believe that a separate compliance filing is necessary. Hardwick shall include this report as part of its DSM annual report to be filed in March, 1995.

Issue Seven: Non-Act 250 C&I New Construction DSM Program:

VPPSA states that it is unrealistic to require a small utility to identify standards for specific electrical equipment, and, in essence, develop a new program design for C&I new construction. VPPSA observes that no other Vermont utility has designed such a program.

We note that Hardwick's own program design, filed in this Docket, states that it plans to work with communities to establish minimum standards for electric equipment. The Hearing Officer's recommendation is not unreasonable. We would like to have more information about this program. Of course, the November 1 filing date is no longer realistic, and thus, we direct Hardwick to provide us with additional information, as part of its March, 1995, DSM annual report.

Issue Eight: Equipment Replacement and Renovation DSM Program:

VPPSA disagrees with the PFD recommendation that requires Hardwick to contact CVPS and GMP to discuss joint implementation of this program.

We note that it may be fruitful for Hardwick to negotiate with GMP and CVPS about the possibility of implementing its program in conjunction with theirs. VPPSA, in its comments on the PFD, mentions that it has already spoken with these utilities and intends to continue these discussions. We encourage those discussions and would like to know of their status at the time Hardwick files its next DSM annual report.

Issue Nine: Small C&I DSM Program:

The DPS argues that Hardwick's program design contains inadequate incentives and limited measure offerings and, as a result, is likely to create lost opportunities. The DPS recommends rejecting this program design, or in

the alternative, requiring Hardwick to provide an interim report on the program's performance by January 6, 1995, with the possibility of subsequent reports, if necessary.

We support the Hearing Officer's conclusions in this matter. Hardwick should pay particular attention to the performance of this program and report its findings as part of its 1994 DSM annual report. At that time, we will decide whether a six-month update regarding the status of this program is warranted.

Issue Ten: Timing of Hardwick's Next IRP:

The DPS asserts that the Hearing Officer has not exercised sufficient scrutiny in selecting June 1, 1996, as the date for Hardwick to file its next IRP. While, in general, the DPS raises valid concerns, we conclude that in order for Hardwick to incorporate the necessary changes identified in this order and to gain experience in implementing its DSM programs, a filing date of June 1, 1996 is appropriate and reasonable.

Concluding Observations

In June, 1992, the parties to this Docket contemplated a process for review and approval of IRPs filed by VPPSA-member utilities that would build upon prior experience and, hopefully, lessen the burden on all participants in these proceedings. Docket No. 5270-HDPK-1, et al, Order of 6/25/92. The experience to date has not demonstrated a reduction of burdens on the parties to these proceedings, but an increase in the time to review the IRPs, the amount of prefiled testimony, the length of hearings, and the general contentiousness among the parties.

We encourage VPPSA and the DPS to review our decisions in the Orders approving the program designs, with modifications, for VPPSA-member systems in the towns of Ludlow, Lyndonville, and Hardwick. Where appropriate, those Orders can serve as standards for designing and reviewing other VPPSA-member utilities' IRPs. We further encourage the parties to approach their tasks in these proceedings with an understanding of the capabilities and limitations of small municipal utilities. The benefits of a particular analytical approach or program design should always be weighed against the costs of that choice.

VPPSA may wish to consider relying more on the DPS's resources and experience with other utilities' IRP filings. The DPS may wish to consider placing less emphasis on initial program designs, while concentrating more on refining programs based on implementation experience. Together, VPPSA and the DPS may wish to work towards defining minimum standards appropriate for integrated resource plans and DSM programs adopted by VPPSA-member utilities.

#### VI. ORDER

IT IS HEREBY ORDERED, ADJUDGED, AND DECREED by the Public Service Board of the State of Vermont that:

1. The Findings, conclusions, and recommendations of the Hearing Officer are hereby adopted, except as modified herein.
2. Hardwick's IRP is approved, as modified herein.
3. Hardwick's load forecast is acceptable under the condition that Hardwick limit reliance on its forecast to identifying avoided cost for determining cost-effective T&D improvements and energy efficiency resource acquisition strategies so as to not delay the capability development of these resources.
4. For future IRPs, Hardwick shall: (1) utilize more refined load forecasting techniques, including consideration of various scenarios and end-use modeling; and (2) better conform to the requirements of the Department's Twenty-Year Electric Plan.
5. Hardwick shall be prepared to demonstrate the use of least-cost integrated resource planning principles in all future supply resource acquisitions. For the next IRP, Hardwick shall amend the supply plan by: (1) clearly explaining the rationale used in arriving at its supply resource portfolio that includes demonstrating or describing the use of economic and other relevant criteria in selecting resources and meeting its operating reserve requirements; (2) ensuring that the supply plan is a least-cost supply plan, adjusted to incorporate the impacts of the DSM programs; (3) enhancing the model of the McNeil wood and natural-gas-fired plant; (4) improving documentation; and (5) modeling capacity sales more realistically by using capacity prices that don't necessarily remain fixed over time.

6. Hardwick shall: (1) complete the optimization study expeditiously; (2) provide the Board and the DPS with an updated schedule for completing the T&D study, the budget for the study, and a copy of the contract between Hardwick and the consultant that is performing the study, by January 6, 1995; and (3) discuss the specifics of the T&D study with the DPS prior to its completion. Hardwick shall improve the documentation of the T&D component for all future IRPs.

7. Hardwick shall redesign its Large C&I program to include a two-year pay-back incentive structure and submit that program to the Board as a compliance filing by January 6, 1995.

8. Hardwick shall modify its Farm DSM program by setting the maximum incentive level to equal or exceed the equivalent of 78 months of customer savings.

9. With regard to its non-Act 250 C&I New Construction program, Hardwick shall file as part of its 1994 DSM annual report, additional information on this program design. That filing shall discuss the standards for specific electrical equipment contemplated by HED and describe in detail the non-Act 250 New Construction program it plans to implement for communities without planning and zoning.

10. Hardwick's 1994 DSM annual report, to be filed on March 1, 1995, shall contain the results and discussion of: (a) its initial monitoring efforts of its Residential New Construction program and, (b) its analysis of the potential impact if Hardwick adopts WEC's program as its own residential new construction program. That discussion shall address whether Hardwick should modify its program to conform with WEC's program.

11. Hardwick shall include in its 1994 DSM annual report a discussion on the status of its discussions with other Vermont utilities regarding the development of a cooperative implementation plan for its Equipment Replacement and Renovation Program.

12. Hardwick shall pay particular attention to appropriate incentive levels as it monitors the performance of the Small C&I program, and specifically address this program design in its 1994 DSM annual report, due on

March 1, 1995.

13. Hardwick shall file a DSM annual report on March first of each year, beginning on March 1, 1995.

14. By January 6, 1995, Hardwick shall file the details of its monitoring and evaluation plans.

15. Hardwick shall file its next IRP on June 1, 1996 and file future IRPs on a three-year cycle following that date.

DATED at Montpelier, Vermont, this 2nd day of  
December, 1994.

<u>s/Richard H. Cowart</u>	)	PUBLIC SERVICE
	)	
<u>s/Suzanne D. Rude</u>	)	BOARD
	)	
<u>s/Leonard U. Wilson</u>	)	OF VERMONT

OFFICE OF THE CLERK

FILED: December 2, 1994

ATTEST: s/Susan M. Hudson  
Clerk of the Board

*NOTICE TO READERS: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board of any technical errors, in order that any necessary corrections may be made.*

*Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Board within thirty days. Appeal will not stay the effect of this order, absent further order by this Board or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Board within ten days of the date of this decision and order.*